Space Weather Forecast

Issued on Tuesday, 14 May 2024 at 01:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Please note: On the 14 May between 1500 UTC and 2100 UTC, a significant data outage at NOAA SWPC is expected which will impact most of our observational data feeds and some models. We may receive data intermittently through that period. MOSWOC service will continue on contingency. Alerts and warnings will be sent using alternative data, if available. The planned data outage may be postponed in the event of significant space weather.

Space Weather Forecast Headline: A reducing risk of Minor-Moderate Geomagnetic storms days 1 and 2 (14-15 May). Chance of Strong flares continues, mainly day 1 (14 May), before easing.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with a long period Moderate-class flare observed at 13/0944 UTC from the large and complex sunspot near the southwest limb. There are fourteen sunspot regions on the disc, with the sunspot region near the southwest limb the most notable. This has continued to show development within its magnetic looping seen on SDO imagery, but is now approaching the southwest limb and is subsequently becoming more difficult to analyse. Given the history, size and complexity of the sunspot, this is expected to dominate the solar activity on the disc even as it rotates over the limb, with all other regions smaller and generally simpler.

Further faint CMEs (Coronal Mass Ejections) have been produced by the large and complex sunspot near the southwest limb, along with a much more notable CME from the long period Moderate-flare, which has been analysed and is considered to missing ahead of Earth, although the shock wave associated with this feature may glance us on day 2 (15 May), although this is low confidence. No other Earth-directed CMEs have been observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds started the period at very strong levels, above 800km/s, with a steady decline to the current Elevated levels, near 550km/s. The magnetic field persisted at Weak to Moderate levels, with the all-important north-south component, starting the period negative (southward), but became mostly positive (northward) from 13/1200 UTC. Geomagnetic activity was at G1-G2/Minor-Moderate storm level at the start of the period, between 13/0000-0600 UTC, declining to mostly Quiet to Unsettled (Kp2-3) conditions.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) are currently above the S1 Minor Radiation storm level, following the recent long-period Moderate-class flare from the large sunspot near the southwest limb.

Four-Day Space Weather Forecast Summary

Solar Activity: Further isolated Strong class flares are likely day 1 (14 May) from the large and complex sunspot on the southwest limb, along with occasional Moderate class flares being expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Solar Wind / Geomagnetic Activity: The long-period Moderate class flare from large and complex sunspot on the southwest limb produced a CME, which has been analysed and is considered to be mostly missing ahead of Earth, although its associated shock wave may glance the Earth on day 2 (15 May), although this is low confidence. No other Earth-directed CMEs currently feature in the forecast. Otherwise, ongoing CME enhanced solar winds, along with any slight influence from a small coronal hole is expected to gradually ease. Activity is expected to be Unsettled to Active at first with an ongoing potential for further G1-G2 Minor-Moderate storms. However, this risk declines through days 1-2 (14-15 May) with mainly Quiet to Unsettled conditions expected by days 3-4 (16-17 May) along with a slight chance of Active intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles is likely to continue above the S1 Minor Radiation storm threshold on day 1 (14 May), before declining. Further increases are also possible given the occurrence of any significant flares from the large and complex sunspot region as it continues to rotate beyond the west limb.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	Yes	25	10	5	5
Strong	G3	No	10	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	90	60	40	20
Very Active	R3 to R5 X	No	70	25	5	5

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	Yes	80	50	10	10
Very Active	**≥ S3 ***	No	15	10	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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